

NEW TAXA OF WESTERN AMERICAN ERYNGIUM (UMBELLIFERAE)

M. YUSUF SHEIKH

Department of Botany, University of California, Berkeley 94720

ABSTRACT

Three local, polyploid taxa of *Eryngium*, *E. constancei*, *E. mathiasiae*, and *E. aristulatum* var. *hooveri*, are described from California.

In a detailed eco-systematic study of *Eryngium* in western North America north of Mexico (Sheikh 1978), I treated the component taxa as section *Armata* of that nearly cosmopolitan genus. The section comprises 12 species and three varieties, of which the following two species and one variety are believed to be new. The two new species are already on the list of rare and endangered plants of California (Smith et al. 1980) and are currently under federal review; the new variety is of comparable rarity.

Eryngium constancei Sheikh, sp. nov.

Plantae perennes graciles debiles effusaeque ramosissimae dense puberulentes; folia basalia adulta lineari-lanceolata vel lanceolati-acuminata margine spinoso-serrata lobataque vel remote spinulosa; petioli quam laminae multo longiores; inflorescentia cymosa ramosa; capitula globosa laxa alba dilute purpureaque, floribus paucibus; bracteae involucales et bracteae florales distinctae, bracteis involucribus lineari-lanceolatis lateraliter paucispinosis quam capitula longioribus, bracteis floralibus margine paucispinosis ad basim scarioso-alatis; sepala lanceolata quam styli multo breviores; fructus ovoidei teres dense squamati, squamellis acuminatis obscure colliculosis dense puberulentis; chromosomatum numerus $n = 16$. (Fig. 1.)

Plants slender, weak, spreading, decumbent or ascending, densely puberulent, 20–30 cm tall from a rootstock bearing fascicled fibrous roots, the first node of principal flowering scape 1–2 cm above rootstock, the scape diffusely branched with 4–6 slender, spreading branches from first or occasionally second node. Basal leaves septate, the earliest bladeless, 15–20 cm long, the later leaves 10–15 cm long with slender, elongate, laterally spinulose petioles 8–12 cm long, usually much longer than blade; blades linear-lanceolate to lanceolate-acuminate, 3–4 cm long, 3–4 mm broad, spinose-serrate to lobed or remotely spinulose, the lobes usually decreasing toward base and grading into petiole, acute; cauline leaves of first or second node like basal

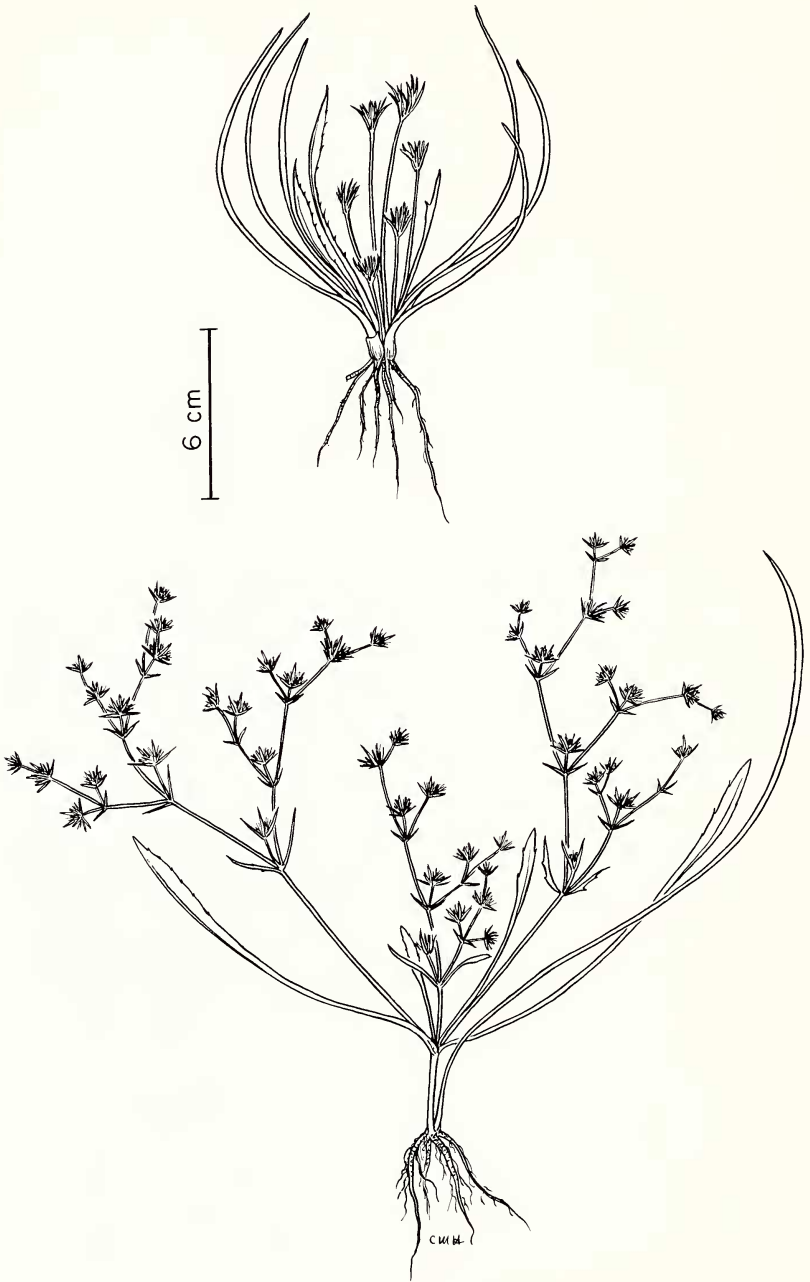


FIG. 1. *Eryngium constancei*. From the type collection.

but smaller, abruptly reduced above to bract-like structures. Inflorescence of cymosely arranged heads, white or often faintly purplish, the peduncles slender, 5–8 cm long, the heads globose, 3–5 mm long, 4–6 mm broad, rather loosely 5–7-flowered. Involucral bracts 4 or 5, distinct from bractlets, linear-lanceolate, ascending, 6–7 mm long and ca. 1 mm broad in flower, becoming 7–9 mm long and 1.5–2 mm broad in fruit, exceeding head, marginally spinose with 2 or 3 pairs of spines to 1.5 mm long, subulate, scarious-winged at base with broad, short, distally spinose wings, densely puberulent dorsally. Bractlets 1–3, 5–6 mm long and 0.6–0.8 mm broad in flower, exceeding flowers, becoming 6–6.5 mm long and 0.7–1 mm broad in fruit, with 2 pairs of marginal spines to 1 mm long and with short, broad, scarious basal wings enfolding fruit, densely puberulent dorsally. Sepals lanceolate, ca. 2 mm long and 0.5–0.6 mm broad in flower, becoming 2.2–2.5 mm long and ca. 0.7 mm broad in fruit, scarious-margined, entire, cuspidate; petals white (rarely purplish distally), oblanceolate, ca. 1 mm long and ca. 0.5 mm broad, puberulent on margin, 3-fid; styles 2–2.5 mm long, equalling to longer than sepals in flower, becoming 3–3.5 mm long and much longer than fruiting sepals. Fruit ovoid, 1.6–2.2 mm long, 1.2–1.5 mm broad, shorter than styles but almost equalling sepals, densely squamate, the scales acuminate with an obscure calycine row, 0.5–0.7 mm long and ca. 0.2 mm broad, appressed, the calycine and lateral scales longer and ascending, becoming abruptly smaller toward base, white or brown, obscurely colliculate, densely puberulent. Cotyledons linear, 1.5–1.8 cm long, ca. 0.5 mm broad. $n = 16$.

TYPE: USA, CA, Lake Co., drying vernal pool along roadside in meadow with *Pinus ponderosa* and *Quercus kelloggii*, Loch Lomond, 12 May 1973, *Sheikh and Constance 545* (Holotype: UC; isotypes: BM, F, GH, K, LE, MAK, MEXU, MO, NY, ORE, OSU, P, PH, RM, RSA, S, US, WS, WTU).

PARATYPES: USA, CA, Lake Co., Loch Lomond, 8 Jun 1941, *Hoover 5342* (UC, US); 19 Aug 1958, *Crampton 5108* (UC). Known only from the type locality.

Eryngium constancei closely resembles *E. aristulatum* var. *aristulatum* but can be distinguished readily by the dense puberulence and the sparse flowers, which usually number five (but never more than seven) per head.

This species is named for Dr. Lincoln Constance, Professor Emeritus of Botany, University of California, Berkeley, who is a long-time student of the family Umbelliferae, with a particular interest in New World *Eryngium*.

***Eryngium mathiasiae* Sheikh, sp. nov.**

Plantae perennes aliquantum crassae adscendentes vel erectae ramosae glabrae; folia basalia adulta lanceolata vel anguste obovata

margine spinoso-serrata spinoso-lobataque; petioli quam laminae longiores; inflorescentia cymosa ramosa; capitula subglobosa condensata pedunculata alba, floribus numerosis; bracteae involucales et bracteae florales haud distinctae lineares dorsaliter lateraliterque spinosae, bracteis floralibus ad basim scarioso-alatis; sepala lanceolata styli subaequantur; fructus oblongi teres dense squamati, squamellis acuminatis aristatis subtiliter colliculosis; chromosomatum numerus $n = 32$. (Fig. 2.)

Plants rather stout, ascending to erect, glabrous, 30–40 cm tall from a rootstock bearing fascicled fibrous roots, the first node of principal flowering scape 1.5–2 cm above rootstock, the scape 3–4-branched from first (or second) node. Basal leaves obscurely septate, subrosulate, the earliest bladeless, or with a few linear segments, or bearing an elliptic blade 10–28 cm long, the later leaves 10–17 cm long with a petiole 6–10 cm long, dilated, laterally spinulose to spinose-lobed, longer than blade; blades lanceolate to narrowly obovate, 3–5.5 cm long, 1.5–2.5 cm broad, finely to coarsely spinose-serrate to spinose-lobed, tapering at base and merging into petiole, acute to obtuse; cauline leaves like basal, the upper sessile, opposite, and reduced. Inflorescence of cymosely arranged heads, the peduncles slender to moderately stout, 0.8–1.8 cm long, the heads subglobose, 8–11 mm long, 8–12 mm broad, compactly 30–37-flowered. Involucral bracts 6 or 7, scarcely distinct from bractlets, linear, somewhat rigid, spreading to ascending, 12–15 mm long and 1–1.3 mm broad in flower, becoming 13–23 mm long and 1.2–1.8 mm broad in fruit, 1.5 to twice as long as head, sparsely to densely spiny both dorsally and laterally (occasionally naked dorsally), the lateral spines up to 5 mm long, acuminate-pungent, slightly dilated at base. Bractlets flexuous, spinose-margined but not callous-margined, like bracts, 7–10 mm long and 0.6 mm broad in flower, slightly to greatly exceeding flowers, becoming 9–15 mm long and 1–1.3 mm broad in fruit, usually densely spiny both dorsally and laterally, the spines 2–3 mm long, the dorsal spines inserted ca. 2–2.5 mm above base of bractlet, the base with scariosus, distally spinose wings enfolding fruit. Sepals lanceolate, ca. 2.7 mm long and ca. 0.7 mm broad in flower, becoming 3–3.5 mm long and 1 mm broad in fruit, the margins scariosus, entire or scariosus-toothed, cuspidate to pungent; petals white, oblong, 1.7 mm long, 0.5–0.6 mm broad, 4-fid; styles 2.5–3 mm long, equalling to slightly exceeding fruiting sepals. Fruit oblong, 2.5–3 mm long, 1.3–1.5 mm broad, shorter than styles but equalling to longer than sepals, densely squamate, the scales lanceolate, acuminate to aristate, the calyxine 0.8–1.2 mm long, 0.2–0.5 mm broad, laterally appressed, subequal, the calyxine and lateral ones longer, becoming smaller toward base, the surface colliculate, glabrous to finely puberulent. Cotyledons linear, ca. 2 cm long, ca. 1 mm broad. $n = 32$.

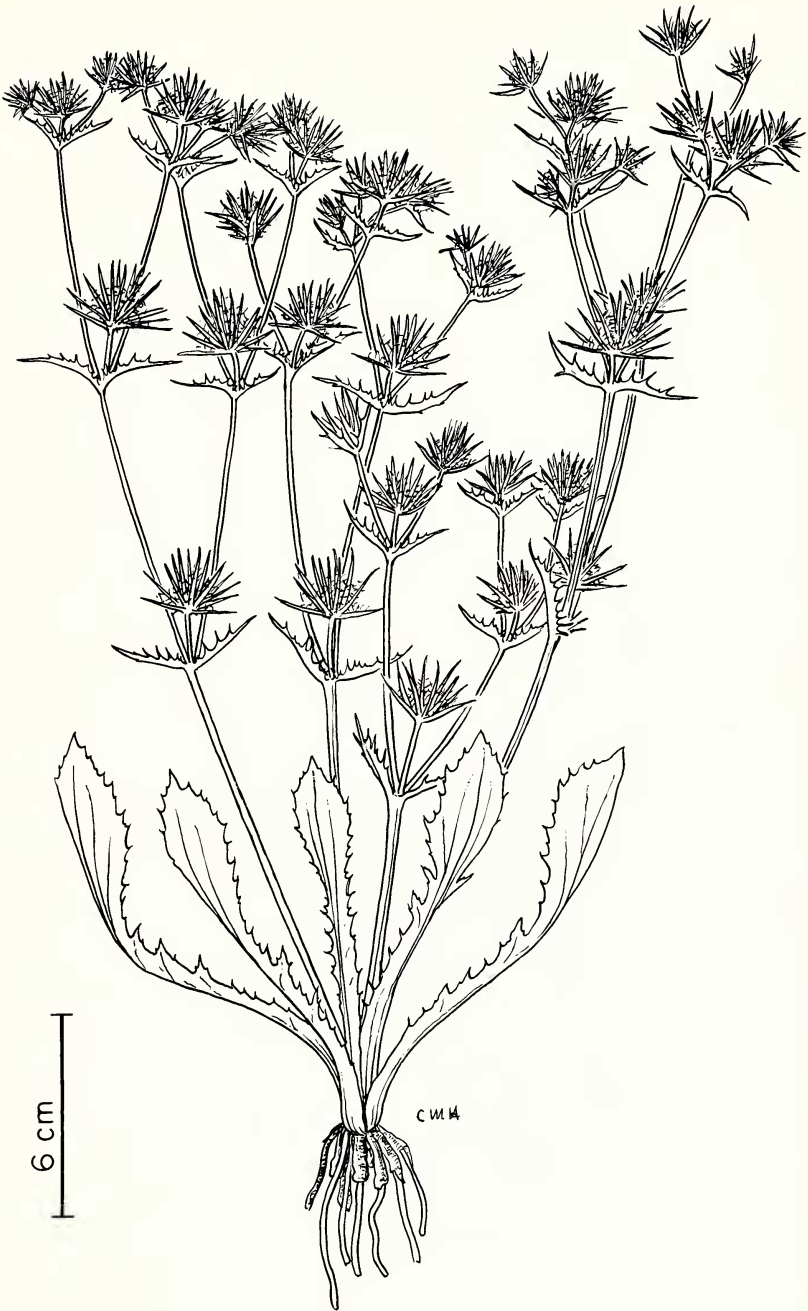


FIG. 2. *Eryngium mathiasiae*. From the type collection.

TYPE: USA, CA, Modoc Co., drying roadside swale, opening in *Pinus-Juniperus* woodland 15.8 km nww. of Canby on State Hwy 139, 27 Jun 1973, *Sheikh and Constance 551* (Holotype: UC; isotypes: F, MAK, S).

PARATYPES: USA, CA, Modoc Co.: 1.6 km s. of Doublehead, 2 Jul 1934, *Howell 12347* (CAS, DS, GH, POM, US); 12.9 km nw. of Canby, 14 Jun 1940, *Eastwood and Howell 8212* (CAS, GH); nw. of Lookout, 27 Jun 1973, *Sheikh and Constance 552* (UC), 18 Jun 1958, *Raven and Solbrig 13322* (UC); Lassen Co.: 5.4 km n. of Bieber, 27 Jun 1973, *Sheikh & Constance 553* (UC); 8 km se. of Bieber, 3 Jul 1934, *Howell 12382* (CAS, DS, GH, POM, US); Shasta Co.: 4.3 km ne. of McArthur, 27 Jun 1973, *Sheikh and Constance 554* (UC).

This northeastern Californian taxon appears to blend the distinctive characters of two species: leaf size and shape are like that of *E. alismaefolium*, whereas the dorsally spinose bracts and bractlets recall those of *E. castrense*. The taxon is, nevertheless, quite distinct because the basal leaves are much shorter than the branches and the petioles are longer than the spinose-serrate to spinose-lobed blade.

The species is named for Dr. Mildred E. Mathias, Professor Emeritus of Biology, University of California, Los Angeles, who has contributed greatly to knowledge of the family Umbelliferae, especially in the New World.

***Eryngium aristulatum* Jepson var. *hooveri* Sheikh, var. nov.**

Plantae infirme adscendentes vel erectae; folia basalia adulta sub-integra vel grosse incisa; capitula 10–32-flora; bracteae involucrales et bracteae florales spinosi dorsales destituti, bracteis floralibus lateraliter paucispinosis; sepala ovati-lanceolata quam styli plerumque leviter longiores; chromosomatum numerus $n = 16$. (Fig. 3.)

Plants weakly ascending to rarely erect, glabrous, 10–54 cm tall, the first node of principal flowering scape 0.4 cm above rootstock, the scape with 4 or 5 branches radiating from first, second, third, or fourth node. Later basal leaves 9–26 cm long with petioles 5–13 cm long; blades 3–6 cm long, 0.7–2 cm broad, spinose-serrate or coarsely incised (rarely entire). Heads 5–23 mm in diameter, 10–32-flowered; involucral bracts usually 5, 5–15 mm long and 1–2.5 mm broad in flower, becoming 20–22 mm long and 1.5–3 mm broad in fruit, marginally entire or with 3 or 4 pairs of subopposite spines 1–2 mm long, glabrous dorsally; bractlets exceeding flowers, with 1 or 2 pairs of lateral spines, naked dorsally; sepals ovate-lanceolate, 1–1.5 mm long and 0.4–0.7 mm broad in flower, becoming 1.3–2 mm long and 0.8 mm broad in fruit; petals ca. 1 mm long, 3-fid (rarely 4-fid); styles 0.6–1.5 mm long, shorter than sepals in flower, becoming 0.9–2.4 mm long, shorter than to slightly exceeding fruiting sepals. Fruit 1.7–2 mm long, 1–1.6 mm

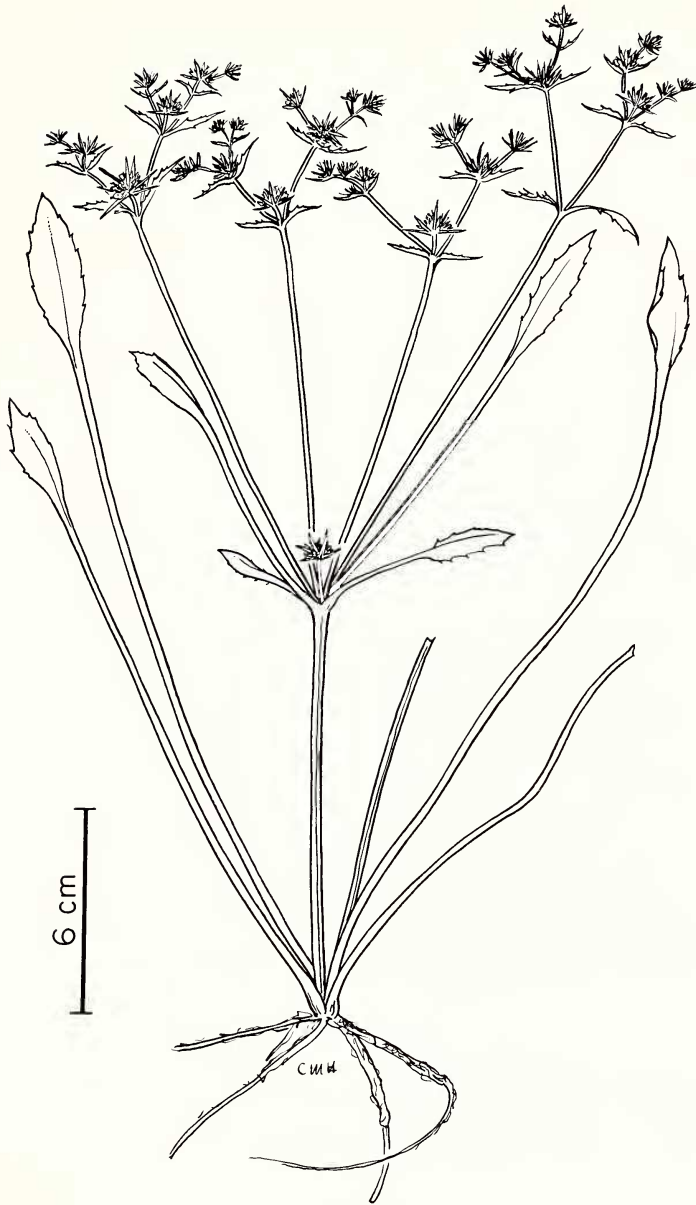


FIG. 3. *Eryngium aristulatum* var. *hooveri*. From the type collection.

broad, equalling to longer than styles and sepals, the scales ovate-lanceolate, acuminate, 0.5–1 mm long, 0.2–0.5 mm broad. Cotyledons not seen. $n = 16$.

TYPE: USA, CA, San Benito Co., slightly alkaline depressions in lacustrine plain at n. end of San Felipe (Soap) Lake, on State Hwy 152, 4.7 km w. of intersection with San Felipe Rd, 31 Jul 1978, *Sheikh and Constance 632* (Holotype: UC; isotypes: BM, F, GH, K, LE, MAK, MEXU, MO, NY, ORE, OSU, P, PH, S, US, WS).

PARATYPES: USA, CA, San Benito Co.: 11.3 km n. of Hollister, 16 Aug 1933, *Rose 33318* (CAS, DS, LE, RM, S, WTU); Gilroy–Hollister, 14 Aug 1917, *Abrams 6673* (DS); San Luis Obispo Co.: 20 Jul 1908, *Jepson 3070* (JEPS, WTU); Laguna, 3 Aug 1940, *Hoover 6265* (CAS, UC), 24 Aug 1946, *Hoover 6328* (CAS), 25 Aug 1969, *Hoover 11555* (CAS, UC), 31 Oct 1908, *Condit s.n.* (UC); Cambria, 26 Jun–17 Jul 1876, *Palmer 155* (F, GH, MO, NY, US); Santa Clara Co.: Alviso, 20 Oct 1902, *C. F. Baker 1827* (GH, K, MO, NY, POM); Agnew, 19 Oct 1902, *Abrams 3089* (DS, JEPS, POM); Gilroy–Morgan Hill, 1 Jun 1916, *Abrams 5667* (DS, NY); 1.6 km e. of Palo Alto, 18 Oct 1899, *Ward 121* (GH, NY, US); Palo Alto, Oct 1901, *Abrams 2232* (DS, MO, NY, POM); Stanford University, 1899, *Elmer 1806* (DS, POM).

This taxon, which appears to be intermediate between *E. armatum* and *E. aristulatum* var. *aristulatum*, occurs in coastal California from San Francisco Bay to San Luis Obispo County. The aspect of the plant, especially size and shape of leaves, is like that of *E. aristulatum*, whereas shape of bracts and bractlets and the short styles (shorter than calyx) resemble those of *E. armatum*.

This variety is named for the late R. F. Hoover, who had a life-long devotion to the California flora and who did much of the research for the taxonomic treatment of *Eryngium* in Jepson's "Flora of California" (1936). In his "Vascular Plants of San Luis Obispo County" (1970, p. 214), Hoover referred to it as "*E. aristulatum* Jepson. Locally found only around the Laguna near San Luis Obispo (6265, 6328)."

ACKNOWLEDGMENTS

The writer wishes to thank Professor Robert Ornduff for provision of a Research Associateship and facilities; the staffs of the Botanical Garden and the herbarium at the University of California, Berkeley, for various assistances; and Professor Lincoln Constance, for general thesis supervision. The illustrations in this paper were prepared by C. M. Hannan from sketches made by the author.

LITERATURE CITED

- HOOVER, R. F. 1970. The vascular plants of San Luis Obispo County, California. Univ. California Press, Berkeley.
 JEPSON, W. L. 1936. *Eryngium*. In A flora of California 2:655–662. Univ. California Press, Berkeley.

- SHEIKH, M. Y. 1978. A systematic study of West North American *Eryngium* (Umbelliferae–Apiaceae). Ph.D. dissertation, Univ. California, Berkeley.
- SMITH, J. P., JR. et al. 1980. Inventory of rare and endangered vascular plants of California. California Native Plant Society. Spec. publ. 1, ed. 2.

(Received 25 Jan 1982; revision accepted 15 Apr 1982.)

ANNOUNCEMENT

Additions to the flora of the White Mts., California and Nevada. Dean Wm. Taylor and Mary DeDecker have published a list of over 40 range extensions for the White Mts. (CNPS Bristlecone Newsletter Vol. 1, No. 4:3–5. A reprint of the list is available upon request (send 20¢ stamp) to: PO Box 194, Lee Vining, CA 93541.